

### Remarks

Reconsideration of the above application is respectfully requested.

Claims 106-123 have been rejected under 35 U.S.C. §112, second paragraph as being indefinite for failing to point out and claim the subject matter of the invention. The Examiner is stating that the term “viable” in claim 106 is a relative term that renders the claim indefinite. The Examiner believes that the term “viable” is not defined by the claim and the specification does not provide a standard for ascertaining the requisite degree and one of ordinary skill in the art would not be reasonably appraised of the scope of the invention. The Examiner further states that it is common knowledge in the art that suggests when a suspension of cells is sterilized, the cells die and lose their viability.

It is commonly understood in the art that “viable” cells are living cells. In reviewing claim 77, wherein there is a step of adding a water-soluble acid to the composition defined in step IV, and as defined in claim 106, the resulting composition of step V is sterilized and has viable cells added to the sterilized composition. Clearly, the viable cells are added after sterilization of the composition or composite mixture. Therefore, cells are not being sterilized and there is no loss of viability. Indeed, the addition of aseptically viable cells would not detract from the already sterilized composite mixture. The Examiner is requested to re-read claims 77 and 106 in view of these comments and respectfully withdraw the rejection under the second paragraph of 35 U.S.C. §112.

Claims 91-104 have been rejected under 35 U.S.C. §102(b) as being rejected by the previous Scherr reference, U.S. Patent No. 5,718,916 or the Patel reference, U.S. Patent No. 5,470,576. Claims 91-104 are “product by process” claims. The Examiner states that these types of claims are not limited to the manipulations of the specific steps of the process only by the structure implied by the claimed steps. The Examiner believes the Scherr reference discloses water-insoluble alginate sponges

in the abstract, and examples 6-8, so that the Scherr reference anticipates the limitations of the claimed invention. The Examiner further states that the Patel reference teaches the use of similar alginate compositions as wound dressings on absorbent pads or bandages by impregnation of the pads with alginate composition.

In the teaching in the Scherr reference, there is a requirement that the final composition be frozen and lyophilized to dryness as a necessary and final step in its preparation. The presently claimed invention obviates the freeze-drying requirement to create a medical dressing. The claimed composition and process provide an alginate composition that is layered onto fibrous cloth which becomes part of the dressing and therefore avoids the additional steps for medical personnel treating a wound or burn having to procure two separate sterile dressings 1) the dressing that will be applied to the wound and, 2) the backing which has to be placed over the dressing before the latter can be fixed in place.

The Scherr reference requires a water-soluble agent that can chemically cross-link with the alginate moiety. Typically, the cross-linking agent can be melamine formaldehyde. No such agent is required or claimed in the present invention.

The Scherr reference further requires an aqueous insoluble agent that can form a coacervate with a water-insoluble alginate hydrogel. Typically, the agent may be a wax, lipid, or latex particle. No agent of this nature is disclosed or claimed in the present application.

Clearly, the Scherr reference does not anticipate the claimed invention.

The Patel reference is also being used by the examiner to anticipate the subject claims. The Patel reference does not disclose the preparation of an insoluble alginate in form of a sponge or foam. The presently claimed invention is directed an alginate in sponge form and therefore has a greater capability of absorbing exudates from a wound or burn. This is not disclosed or claimed by the Patel reference. The Patel reference discloses

the use of woven or non-woven fabrics. Woven and non-woven fabrics are prepared from fibers and have absolutely no bearing or relationship to the foamed composition claimed in the present application.

The claimed invention further requires a cation metal salt which complexes with water-soluble alginate to form a water insoluble alginate hydrogel. In distinction, the Patel reference requires the use of a sodium alginate composition that is used to impregnate a cloth that must be coated with ethyl alcohol to prevent the alginate from gelling immediately upon contact with water. The currently claimed process of the present invention from which the noted claims depend results in a fibrous cloth that becomes the backing of the active composition which is utilized to treat a wound or burn. In the Patel reference, the alginate composition cannot be utilized nor retain its integrity and must be impregnated into a non-woven fabric in order to retain and hold together the alginate composition. The highly foamed composition of the claimed invention would not be feasible for use in the Patel reference and therefore the teachings and claims of the Patel reference would not anticipate the presently claimed invention.

The Patel reference recognizes the requirement to have a second dressing or backing for its composition, a requirement that is divergent from the claimed invention. A highly foamed composition of the present invention can be utilized with one backing. It would not be desirable to use two dressings as required by Patel. Patel acknowledges at Column 7, lines 30-36 the requirement of two dressings:

“Since it is to be expressly understood that the invention is in general applicable to the per se known wound dressing structures including a gauze pad or the like for placement on the wound, it will be appreciated that various other modifications in structure per se comprise no part of this invention. For this reason, such modifications need not be discussed further.”

Patel clearly understands that an additional placement of a pad to cover the active dressing is needed. With reference to the claimed

invention, the medical personnel are not required to procure two sterile dressings in order to treat a wound or burn. The claimed composition of the present invention need only be taped to a wound or burn. The Patel reference does not anticipate the presently claimed invention.

The presently claimed invention may also utilize medicaments, as shown in Examples 3, 7, and 8 of the specification. There is no such disclosure in the Patel reference.

The claimed invention has the following attributes not found in the disclosures of the Scherr and Patel references:

1. A foamed dressing fabricated from an alginate chemical that enhances the absorption of exudates from a wound.
2. A built-in backing simultaneously applied with the production of the dressing that obviates the necessity of medical personnel having to purchase, stock and apply two separate sterile dressings, one of which would be the backing to which an adhesive is applied to affix it to the patient.
3. A delivery system for a variety of medicinal products that can be placed into a foamed alginate dressing of the present invention.
4. The capability of many alginate moieties being utilized with the claimed invention, for example, silver alginate, copper alginate, zinc alginate, etc.

The Examiner has failed to show that product-by-process claims 91-104 are anticipated by the Scherr and Patel references. Therefore, the rejection should be withdrawn.

Claims 91-104 and 124-149 have been rejected under 35 USC 103 (a) as being unpatentable over the Bakis reference, U.S. Patent No. 5,851,461 in view of the Patel and Scherr references. The Examiner believes that the combination of the alginate salts of Patel and the medicinal agents of Scherr along with implanted cells and sodium or

calcium alginate foams of the Bakis reference would lead one skilled in the art to the presently claimed invention.

Upon a review of the Bakis reference there is no disclosure of di- or tri- valent alginate salts of silver. Further, the Bakis reference suggests the use of various ingredients that appear to be unsuitable for use in a medical dressing for use with wounds or burns. From a reading of the reference, it is unclear whether the intention of the teachings of the reference is to produce a medical dressing. The reference teaches the cross-linking of a starch-foam with formaldehyde in an alcoholic solvent. Formaldehyde is dangerous and not recommended for use with humans. It is commonly known that it may result in carcinogenesis of tissues where it might topically be applied. Further, the Bakis reference cross-links a polysaccharide, chitosan, by treating with a dialdehyde such as gloxal or glutaraldehyde. The latter two substances are extremely dangerous chemicals that will cross-link normal tissues and destroy their capability to function.

Applicant knows of no chemical structure that utilizes a trivalent silver compound in distinction to the Examiner's statement. Applicant respectfully requests that the Examiner supplies Applicant with references in the Bakis disclosure or elsewhere wherein a di- or tri-valent silver molecule is reacted with alginate or any other polysaccharide.

The Examiner has stated the Bakis reference uses cells as a component of its claimed invention. However, upon a review of the reference there is no indication of the presence of such subject matter. Applicant respectfully requests a clarification on this interpretation of the Bakis reference.

Observations of and the following steps of the methodology of the invention described in the Bakis reference will be compared with the claimed invention to distinguish the reference from the presently claimed invention:

a) prepare the foam by mechanical stirring of a soluble polysaccharide

- b) the foam so produced in a soluble polysaccharide is a foam containing air
- c) in order to prevent the foam from rising to the top and disappearing, it has to be stabilized by cross-linking or coagulation; the foam is layered in a tray or cloth
- d) the foam, which has now been layered, must be cross-linked or coagulated either while wet or after it has dried; if it is cross-linked after initial drying, the foam becomes wet and would have to be re-dried again; in the reference, the polysaccharide foam is immersed in a solution of di- or trivalent cations or sprayed with the same forming layers of foamed soluble polysaccharide to immobilize the foam, which again will have to be re-dried
- e) in an alternate embodiment of the Bakis reference, an insoluble carbonate is added to a polysaccharide and mechanically mixed; the soluble foamed polysaccharide composition is then layered on a tray or cloth and treated with an acid to liberate carbon dioxide; the di- valent cations cross-link with the polysaccharide to form a stable structure; the use of the acid requires the foamed polysaccharide to be washed once more and redried.

In the present invention, drying of the polysaccharide is not required. The alginate, for example, is treated with a cation to produce a highly viscous aqueous insoluble alginate. Sodium bicarbonate or similar effervescent substance, that would effervesce with an acid, when acid is added to the composition and stirred, produces a foam trapped in the highly viscous insoluble alginate. The material does not need to be dried nor washed with calcium or other insolubilizing salts and then redried again. In the presently claimed invention, the foam is trapped in the composition.

In the Bakis reference the foam is produced by mechanical stirring, not by the introduction of calcium carbonate upon the addition of an acid. The purpose of adding calcium carbonate and an acid is to produce

soluble calcium ions that react with the soluble foamed structure. Thus, the foamed aqueous soluble polysaccharide does not lose the entire foam into the air. That is prevented by causing the foam to be immobilized with the divalent calcium ions.

The methods of the Bakis reference require two separate dryings and the calcium carbonate does not act as an effervescent compound.

There are inconsistencies with the Bakis disclosure. Chitosan is not soluble in an aqueous solution unless the solution is made highly acidic, suggests the Bakis reference. If the chitosan is used as an acid soluble polysaccharide, as shown in one of the embodiments of the Bakis reference, then it would be mandatory to remove all of the acid after foaming, but prior to drying. If it would be dried, the concentration of acid would destroy the molecular structure of the chitosan as well as any medicaments present in the formulation. If starches were used, they would be solubilized in an alkaline solution and if acid were added to an insoluble carbonate as shown by the Bakis reference, the later addition of an acid would be neutralized by the basic nature of the solution of starches and therefore not be available to produce cations necessary to stabilize the foam in a tray or sheet.

In the Bakis reference, alginic acid is described as an aqueous polysaccharide, which it is not. It is conventionally known that it is insoluble in aqueous solutions.

The foam of the Bakis reference is not a separate chemical. It is never treated. The foam is merely a bubble of air in a composition in which it has been entrapped by mechanical stirring. Every example of the Bakis reference discloses beating or mechanical agitation of the solution to form a foam. There is no teaching in the Bakis reference that the addition of chemicals is needed to ensure the foam is entrapped in the composition. Contrary to the examiner's statement, foaming in the Bakis reference occurs solely by mechanical agitation. A chemical characterized as a foaming agent may be introduced into the Bakis composition, but it is

merely a surface-active agent that assists foaming in a solution that is mechanically agitated by high speed stirring to form the foam. In addition, the Bakis teachings require a cross-linking agent for the foam, after it is formed. The foam is fixed by using an insoluble carbonate salt, which is dispersed in the already foamed polysaccharide. If the foam is not fixed, the buoyancy of the foam would overcome the viscosity of the solution and rise to the top and dissipate into the air. The claimed process of the present invention, from which the product by process claims depend, uses an effervescent carbonate salt in an acid and is totally divergent from the teachings of the Bakis reference.

In the presently claimed invention, carbon dioxide or other inert gases are utilized in the formation of foam. In contrast, the process of the Bakis reference, by using mechanical agitation, introduces air or oxygen into the foam composition. An aerobic foam may be the host of bacteria and pathogenic molds, which grow in an aerobic environment. The Bakis alginate composition, when placed on an exudating wound will more likely support bacterial growth of aerobic bacteria and molds than the alginate composition of the claimed invention, which contains an inert anaerobic gas, and therefore less likely to support the growth of aerobic pathogenic microorganisms.

The Bakis disclosure describes a foam that is dried with heated air. When the dried polysaccharide foam is a soluble alginate or any other soluble polysaccharide, the resulting product is soluble in aqueous solutions, such as water, serum or blood. A medical dressing could hardly function when placed on an exudating wound if the composition therein was water soluble, for it would dissolve. The Bakis reference therefore, cross-links sodium alginate with calcium ions. Thereafter the polysaccharide is washed with water and dried. The polysaccharide is then restored to the soluble state or partial soluble condition by neutralizing the cross-linking agent. This activity is clearly divergent from the claimed invention, which produces an insoluble alginate composition which has



been formed into a foam and which will retain its integrity when placed on exudating or bleeding wounds, and not dissolve.

A further distinction in the teachings of the Bakis reference and the presently claimed invention relates to the use of a foam modifier, a high molecular weight substance to enhance the viscosity of the Bakis product. A chemical modifier is added to the aqueous soluble polysaccharide solution of the Bakis reference to increase the viscosity of the solution after the foam is prepared, as shown in Example 11 of the reference. No foam modifiers are claimed in the present invention to retain the foam and avoid collapse or dissipation.

The Bakis reference describes a process clearly divergent from the claimed invention. It requires the preparation of an aqueous soluble polysaccharide that after being foamed, is dried, converted to an insoluble foamed polysaccharide, which is then washed and dried. Some of the cross-linking chemicals are removed to restore the preparation to a partially soluble, partially insoluble polysaccharide. Optionally, all of the cross-linking cations can be removed to substantially restore the preparation to the initial water-soluble foam polysaccharide, which then requires additional washing and drying. None of the above would lead one skilled in the art to the presently claimed invention.

The Bakis reference does layer the product onto cloth material for the purpose of providing an intact backing, which would not require a secondary backing for the dressing, as suggested by the examiner. The Bakis composition is layered on a nonwoven material and the foam is strengthened by the manipulatory chemical procedure as described in Claim 13. Afterwards, the fabric upon that the material was layered is discarded. The necessity of utilizing a fabric on which to layer and manipulate the composition is required because the composition would dissolve and dissipate if it did not have a supporting backing. A backing that is not required or claimed by applicant.

It is clearly noted that the teachings of the Bakis reference do not

suggest the presently claimed invention. The Patel reference does not disclose trivalent alginate salts but cites U.S. Patent 4,948,575 presumably discloses water-insoluble di- or tri- valent metal salts. It adds nothing to the teaching of the Bakis reference, nor does the Scherr reference. There is no feasibility to use water insoluble di- or tri- valent metal salts or the same silver salts of alginate in the Scherr reference. Therefore, the teachings of the Bakis reference, taken alone or in combination with the Patel and Scherr references, would not lead one skilled in the art to the presently claimed invention.

It is submitted that the claims meet the requirements of 35 U.S.C. and therefore, an early Notice of Allowance is respectfully requested.

Respectfully submitted,



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